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1. JP,11-106570,A
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CLAIMS DETAILED DESCRIPTION
TECHNICAL FIELD PRIOR ART
EFFECT OF THE INVENTION
TECHNICAL PROBLEM MEANS
EXAMPLE

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]

[Field of the Invention] This invention is a resin composition which consists of polyolefine and polyamide, and can be conveniently used as a charge of reinforcement of rubber or resin.

[0002]

[Description of the Prior Art] In order to raise the elastic modulus and

mechanical strength of rubber, resin, etc., glass fiber and an inorganic bulking agent were blended. However, when these were blended, rigidity, an elastic modulus, intensity, and creep resistance improved, but the appearance of mold goods worsened and mold goods were heavy.

[0003]The constituent which was distributing the thermoplasticity nature polyamide fiber as detailed textiles by making polyolefine and rubbery polymer into a matrix at JP,7-238189, A and JP,9-59431,A is indicated. If these blend with rubber, they can raise mechanical properties. However, there was rubber to blend, also when it was limited and gelled during kneading. It was a tendency which is easy to gel especially at an elevated temperature, and there were intensity, elongation, an elastic modulus, etc., also when original character was not revealed. On the other hand, the multicomponent textiles which have a range with a specific boundary line of the inside-and-outside layer which has a fold as a substrate component for leather are indicated by JP,63-75108,A as a manufacturing method of polyamide super-thin textiles. In the mixed high-speed **** textiles produced by carrying out mixed high-speed **** of the polyamide at JP,54-73921,A, solvent removal of polystyrene and the polyethylene glycol is carried out, and polyamide super-thin textiles with a thickness of 0.1 denier are indicated. The lightweight bicomponent fiber which does not have exfoliation by the interface of polypropylene and polyamide in JP,3-279419,A, JP,4-272222,A, and JP,4-281015,A is

indicated. The dye affinity of polypropylene is aimed at the improvement for sheath-core textiles. However, high-speed **** of these methods or textiles cannot be extruded and carried out from a **** nozzle with a small caliber, or since it was the purposes solvent treatment, in addition to fuse and to obtain super-thin textiles with a thickness (d) of 0.1-1 denier, they cannot be said to be a process with it. [bad productivity and] [economical] Since they were continuous fibers of super-thin textiles, and they were continuous fibers when filling up rubber and resin and kneading, although these textiles are excellent as a raw material of the good textiles of gloss or a hand, and synthetic leather, the distribution by kneading was difficult for them.

[0004] Both compatibility improves in high polymer chemistry, 29,324,265 (1972) and polymers collected papers, and the nylon / polypropylene blend system that made a small amount of maleic anhydride modified polypropylene placed between 47 and 4,331 (1990). A dispersed particle diameter is made very small and mechanical properties (shock resistance, tensile strength) are raised. However, a blend ratio = mechanical properties deteriorated remarkably in the 50/50 neighborhood.

[0005]

[Problem(s) to be Solved by the Invention] An object of this invention is to provide the constituent which solves the above-mentioned problem, is excellent in rigidity, intensity, and creep resistance, and gives mold goods with small density. Super-thin textiles

can manufacture economically, and moreover, dispersibility is good for resin or rubber and it aims at providing the polyolefine polyamide resin composition which is hard to gel when blending rubber moreover.

[0006]

[The means which an invention tends to solve] According to this invention, the (a) polyolefine 90 - 40 weight sections, the (b) polyamide 10 - 60 weight sections, and (c), (a) and (b)100 weight section are received. Silane coupling agent The polyolefine polyamide resin composition which consists of structure which 0.1 to 5.5 weight section and (d) polyamide distributed to fibrous is provided. And a mean fiber diameter fibrous in the dispersed polyamide is 1 micrometer or less, and it is characterized by aspect ratios being 20 or more and 1,000 or less. By carrying out melting and kneading of (a) polyolefine, (b) polyamide, and the (c) silane coupling agent, extruding them, imposing and taking over a draft, and extending or rolling it. (a) The manufacturing method of the polyamide polyolefin resin composition characterized by the thing with a mean fiber diameter of 1 micrometer or less to which it is made to distribute fibrous and a pellet type is made is provided in (b) polyamide in polyolefine.

[0007]

[Embodiment of the Invention]
Hereafter, the constituent in a polyamide polyolefin resin composition of this invention and a manufacturing method for the same is explained concretely. (a) An ingredient is polyolefine and its thing of the

melting point of the range of 80-250 ** is preferred. Not less than 50 ** of things which have a 50-200 ** Vicat softening point preferably especially are also used. As such a suitable example, the homopolymer and copolymer of an olefin of the carbon numbers 2-8, It reaches, The copolymer of the olefin of the carbon numbers 2-8, and aromatic vinyl compounds, such as styrene, chlorostyrene, alpha-methylstyrene, the copolymer of the olefin of the carbon numbers 2-8, and vinyl acetate, the olefin and acrylic acid of the carbon numbers 2-8. Or it is mentioned as that for which a copolymer with the ester, the olefin of the carbon numbers 2-8 and methacrylic acid or a copolymer with the ester, and the copolymer of the olefin of the carbon numbers 2-8 and a vinyl silane compound are used preferably.

[0008]As an example, High density polyethylene, low density polyethylene, linear low density polyethylene, polypropylene, an ethylene propylene block copolymer, an ethylene propylene random copolymer, the poly 4-methylpentene-1, the polybutene 1, the polyhexene- 1, An ethylene-vinyl acetate copolymer, an ethylene vinyl alcohol copolymer, an ethylene acrylic acid copolymer, an ethylene methyl acrylate copolymer, an ethylene ethyl acrylate copolymer, an ethylene acrylic acid propyl copolymer, an ethylene butyl acrylate copolymer, An ethylene 2-ethylhexyl acrylate copolymer, an ethylene acrylic acid hydroxyethyl copolymer, an ethylene vinyltrimetoxysilane copolymer, an ethylene

vinyltriethoxysilane copolymer, an ethylene vinylsilane copolymer, an ethylene styrene copolymer, And there are a propylene styrene copolymer etc. Halogenation polyolefines, such as chlorinated polyethylene, bromination polyethylene, chlorosulfonated polyethylene, are also used preferably. [0009]These As a desirable thing, especially in the polyolefine of the (a) ingredient, High density polyethylene (HDPE), low density polyethylene (LDPE), Linear low density polyethylene (LLDPE), polypropylene (PP), An ethylene propylene block copolymer, an ethylene propylene random copolymer, an ethylene-vinyl acetate copolymer (EVA), An ethylene ethyl acrylate copolymer (EEA) and an ethylene vinyl alcohol copolymer are mentioned, and a melt flow index (MFI) is especially mentioned as what has the most desirable thing of the range for 0. 2-50g/10 minutes. One sort of these may be used and may combine two or more sorts.

[0010](b) Into a main chain, it is the thermoplastic polyamide (following, polyamide) which has an amide group, and the thing of the range of 135-350 ** melting point is used, moreover, an ingredient is high and its thing of the range of 160-265 ** melting point is especially more preferred than the melting point of the polyolefine of the (a) ingredient. As this (b) ingredient, the polyamide which gives tough textiles by extrusion and extension is mentioned as a desirable thing.

[0011]As an example of polyamide. The polycondensation body of ** nylon 6, Nylon 66, a nylon 6-Nylon 66 copolymer, Nylon 610, Nylon 612,

Nylon 46, Nylon 11, Nylon 12, Nylon MXD 6, xylylene diamine, and adipic acid, the polycondensation body of xylylene diamine and pimelic acid, The polycondensation body of xylylene diamine and SUPERIN acid, the polycondensation body of xylylene diamine and azelaic acid, the polycondensation body of xylylene diamine and sebamic acid, the polycondensation body of a tetramethylenediamine, the polycondensation body of terephthalic acid and hexamethylenediamine, and terephthalic acid, The polycondensation body of octamethylenediamine and terephthalic acid, The polycondensation body of trimethyl hexamethylenediamine and terephthalic acid, The polycondensation body of decamethylenediamine, the polycondensation body of terephthalic acid and undecamethylene diamine, the polycondensation body of terephthalic acid and dodecamethylenediamine, the polycondensation body of terephthalic acid and a tetramethylenediamine, the polycondensation body of isophthalic acid and hexamethylenediamine, and isophthalic acid, The polycondensation body of octamethylenediamine, the polycondensation body of isophthalic acid and trimethyl hexamethylenediamine, the polycondensation body of isophthalic acid and decamethylenediamine, and isophthalic acid, Ung. The polycondensation body of decamethylenediamine and isophthalic acid, the polycondensation body of dodecamethylenediamine and

isophthalic acid, etc. are mentioned. [0012] As a desirable example, nylon 6 (PA6), Nylon 66 (PA66), Nylon 12 (PA12), a nylon 6-Nylon 66 copolymer, etc. are especially mentioned among such polyamide. These one sort or two sorts or more may be sufficient. As for such polyamide, it is preferred to have a molecular weight of the range of 10,000-200,000.

[0013] (c) As an example of the silane coupling agent of an ingredient, vinyltrimetoxysilane, vinyltriethoxysilane, and vinyltris (beta-methoxyethoxy) Silang . vinyl -- doria -- a cetyl silane, gamma-methacryloxypropyl trimethoxy silane, and beta-(3, 4-epoxycyclohexyl) ethyltrimethoxysilane. Gamma-glycidoxypolytrimetoxysilane, gamma-glycidoxyl propyl methyldimethoxysilane, gamma-glycidoxypropylmethyldietoxysilane, gamma-glycidoxypropyl ethyl dimethoxysilane, gamma-glycidoxyl propylethyl diethoxysilane, N-beta-(aminoethyl) aminopropyl trimethoxysilane, N-beta-(Aminoethyl) Aminopropyl triethoxysilane, N-beta-(Aminoethyl) Aminopropyl methyl dimethoxysilane, N-beta-(aminoethyl) aminopropyl ethyl dimethoxysilane, N-beta-(aminoethyl) aminopropyl ethyldiethoxysilane, gamma-aminopropyl triethoxysilane, N-phenyl-gamma-aminopropyl trimethoxysilane, gamma - [N-(beta-methacryloxyethyl)-N and N-dimethylannmonium (chloride)] Propyl methoxysilane, a styryl diaminosilane, etc. are mentioned. the basis especially which

takes a hydrogen atom and is easy to be desorbed from an alkoxy group etc. -- and -- or what has a polar group and a vinyl group is used especially preferably.

[0014](c) Silane coupling agent of an ingredient, (a) ingredient The range of 0.1 - 5. 5 weight section is desirable especially preferred to (b) ingredient 100 weight section, and it is the range of 0.2 - 3. 0 weight section. If there is less quantity of a silane coupling agent than 0. 1 weight section, a constituent with high intensity will not be obtained, and if there is more quantity of a silane coupling agent than 5. 5 weight section, the constituent excellent in the elastic modulus will not be obtained. If there is less quantity of a silane coupling agent than 0.1 % of the weight, a firm combination will not be formed between the (a) ingredient and the (b) ingredient, but only a constituent with low intensity will be obtained. On the other hand, since an ingredient (b) will not become a good microfilament if there is more quantity of a silane coupling agent than 5.5 % of the weight, only the constituent which is inferior to an elastic modulus too is obtained.

[0015](c) Organic peroxide can be used together when using the silane coupling agent of an ingredient. It is because the reaction of the (a) ingredient and a silane coupling agent is promoted by forming a radical in the chain of the (a) ingredient and reacting to a silane coupling agent by using organic peroxide together. The amount of the organic peroxide used is 0.01 - 1.0 weight section to (a) ingredient 100

weight section. As organic peroxide, the thing of the melting point of the (a) ingredient or the melting point of the (c) ingredient whose half-life temperature for 1 minute is the same temperature as the higher one thru/or a temperature requirement higher about 30 ** than this temperature either is used preferably. That whose half-life temperature for 1 minute is specifically about 110-200 ** is used preferably.

[0016] As an example of organic peroxide, di-alpha-cumyl peroxide, the 1,1-di-tert-butyl peroxide 3 and 3, 5-trimethylcyclohexane, 1,1-di-t-butylperoxycyclohexane, 2,2-Di-t-butyl-peroxy-butane, n-butyl 4,4-di-t-butyl par oxygen bar RERINETO, 2,2-bis(4,4-di-t-butylperoxycyclohexane) propane, 2,2,4-trimethyl pentyl peroxy neodecanate, alpha-cumyl peroxy neodecanate, t-butyl PAOKISHINEOHEKISANETO, t-butylperoxy perpivalate, t-butyl par OKISHIASETO, t-butyl peroxy laurate, t-butyl peroxybenzoate, t-butyl par OKISHIISO phthalate, etc. are mentioned. What is the range of the temperature whose half-life temperature for 1 minute is especially higher than melt kneading temperature thru/or this temperature about 30 **, and the thing whose 1-minute half-life temperature is specifically about 80-260 ** are used preferably.

[0017](b) The most is distributing the ingredient uniformly in the above-mentioned matrix as detailed textiles. concrete -- the -- it is distributing especially 80% of the weight preferably 70% of the weight as desirable textiles with 90 detailed % of the weight or more. (b) As for the

textiles of an ingredient, it is preferred that a mean fiber diameter is [mean fiber length] 100 micrometers or less in 1 micrometer or less. An aspect ratio (ratio of fiber length/fiber diameter) is 20 or more, and its ***** is preferred at 1,000 or less. And the (a) ingredient is combined by the (b) ingredient and the interface. (a) As for 90 - 40 weight section and the (b) ingredient, the rates of an ingredient and the (b) ingredient are [(a) ingredient / 15 - 35 weight section and the (b) ingredient of the (a) ingredient] 85 - 65 weight sections especially preferably ten to 60 weight section. (b) If there are few improved effects of an elastic modulus or intensity when there are few rates of an ingredient than ten weight sections, and there are more rates of the (b) ingredient than 60 weight sections, the surface gloss of mold goods will be spoiled.

[0018]Next, the manufacturing method of the polyolefine polyamide resin composition of this invention is explained. It is manufactured from the following processes.

(1) Melt kneading of the polyolefine of the (a) ingredient and the silane coupling agent of the (c) ingredient is carried out. Melt kneading and chemicals conversion of the polyamide of the (b) ingredient are carried out to the process of carrying out chemicals conversion, the process of carrying out melt kneading of the polyamide of the (b) ingredient at the (a) ingredient which carried out chemicals conversion of the (2) and (c) ingredient above the melting point of the (b) ingredient, and the (a) ingredient that

carried out chemicals conversion of the (3) and (c) ingredient above the melting point of the (b) ingredient. The process of cooling and pelletizing the process of extending or rolling the process to extrude and the extrusion thing which carried out (4) melt kneading and chemicals conversion applying a draft below with the melting point of the (b) ingredient moreover above the melting point of the (a) ingredient, (5) extensions, or the rolled constituent, to a room temperature, **, ** and others

[0019](1) -- the process of carrying out melt kneading (the following -- the same) of the polyolefine of the (a) ingredient and the silane coupling agent of the (c) ingredient, and carrying out chemicals conversion is explained. Melt kneading temperature is more than the melting point of the (a) ingredient. It is a temperature higher 30 ** than the melting point. If melt kneading is carried out at a temperature higher 30 ** than the melting point, it will react to the silane coupling agent of the (c) ingredient, and chemicals conversion will be carried out. The device usually used for kneading of resin or rubber can perform melt kneading. As such a device, a Banbury mixer, kneader, kneader extruder, open roll, and 1 axis kneading machine, a 2 axis kneading machine, etc. are used. A 2 axis kneading machine is the most preferred at the point that it is a short time in these devices, and melt kneading can be performed continuously.

[0020](2) The process of carrying out melt kneading of the thermoplastic

polyamide of the (b) ingredient to the (a) ingredient which carried out chemicals conversion of the (c) ingredient above the melting point of the (b) ingredient is explained. Melt kneading temperature is more than the melting point of the (b) ingredient. It is a temperature higher 10 ** than the melting point. Since it cannot knead if melt kneading temperature is lower than the melting point of the (b) ingredient, and it does not distribute to fibrous, melt kneading is carried out at a temperature higher than the melting point, especially a desirable temperature high 20 **.

[0021](3) The process of carrying out melt kneading and chemicals conversion of the polyamide of the (b) ingredient to the (a) ingredient which carried out chemicals conversion, and extruding it for it of the (c) ingredient above the melting point of the (b) ingredient is explained. The kneaded material obtained in the process which carries out extrusion is extruded from a spinneret, an inflation die, or a T die. It is necessary to carry out both spinning and extrusion at a temperature higher than the melting point of an ingredient (b). Specifically, it is preferred to carry out in the range of a temperature higher than the melting point of the (b) ingredient and a temperature higher 30 ** than this melting point. Even if this process performs melting and kneading at a temperature lower than the melting point of an ingredient (b), kneaded material does not become the structure which particles with the detailed (b) ingredient distributed in the matrix which consists of a (a) ingredient. Therefore, the (b)

ingredient cannot become detailed textiles even if it does spinning and extension of this kneaded material.